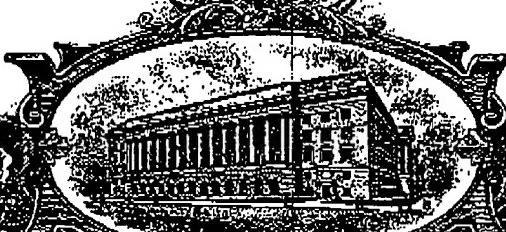


RA 547762



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FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 60/145,246

FILING DATE: July 26, 1999

By Authority of the  
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JCT 115-1 pro

INVENTOR(S)		
Given Name (First and Middle if any)	Family Name or Surname	Residence (City and either State or Foreign Country)
Natan	Tomer	Tel Aviv, Israel
<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto		
TITLE OF THE INVENTION (200 characters max)		
PARKULATOR PHOTO PARKING		
CORRESPONDENCE ADDRESS		
Direct all correspondence to: <input type="checkbox"/> Customer Number <span style="border: 1px solid black; padding: 2px;">  </span> → <b>OR</b> <input checked="" type="checkbox"/> Firm or Individual Name <span style="border: 1px solid black; padding: 2px;">Tipton L. Randall</span>		<input type="checkbox"/> Place Customer Number Bar Code Label here
Address Address <span style="border: 1px solid black; padding: 2px;">19371 55th Avenue</span> City <span style="border: 1px solid black; padding: 2px;">Chippewa Falls</span> State <span style="border: 1px solid black; padding: 2px;">WI</span> ZIP <span style="border: 1px solid black; padding: 2px;">54729</span> Country <span style="border: 1px solid black; padding: 2px;">USA</span> Telephone <span style="border: 1px solid black; padding: 2px;">715-720-2969</span> Fax <span style="border: 1px solid black; padding: 2px;">715-720-2373</span>		
ENCLOSED APPLICATION PARTS (check all that apply)		
<input checked="" type="checkbox"/> Specification Number of Pages <span style="border: 1px solid black; padding: 2px;">14</span> <input checked="" type="checkbox"/> Small Entity Statement <input type="checkbox"/> Drawing(s) Number of Sheets <span style="border: 1px solid black; padding: 2px;">  </span> <input checked="" type="checkbox"/> Other (specify) <span style="border: 1px solid black; padding: 2px;">Declaration RETURN POST CARD</span>		
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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. <input checked="" type="checkbox"/> No. <input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: _____		

Respectfully submitted

SIGNATURE

*Tipton L. Randall*

Date

07/20/99

TYPED or PRINTED NAME Tipton L. Randall

REGISTRATION NO.

32,626

TELEPHONE 715-720-1969

(if appropriate)

Docket Number:

TLR 5058 PV

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**PARKULATOR PHOTO PARKING**~~15~~**FIELD OF THE INVENTION**

The present invention relates to a method of monitoring and assessing a fee for parking a  
5 vehicle in a toll parking location and, additionally, to a method of determining if a vehicle is in violation  
of the requirements for use of the parking location.

**BACKGROUND OF THE INVENTION**

Conventional parking meters are widely used to control vehicular parking and to encourage maximum turnover of limited parking areas. These parking meters also provide a substantial source of income to the municipality or other organization using such meters. Drawbacks to these meters include high initial investment costs, high maintenance costs, and high collection costs, all complicated by vandalism and pilferage. The user also encounters various drawbacks with parking meters. Does the user have coins for the meter? Is the time ordered by inserting coins sufficient to cover the time the user is away from the vehicle? Upon return to the vehicle, the remaining time on the meter cannot be reclaimed. No receipt or record of the parking expense is available.

Alternatively, a number of municipalities have adopted the use of parking coupons. The coupons have tear out sections which indicate the date and the expiration time of a particular parking period, the coupons being displayed from the inside of the vehicle by wedging the coupon into the  
20 upper end of a closed window. However, these coupons have not been found entirely satisfactory in many locations because of illegally tampering with them for more than one use. Additionally, dividing

the city into many parking zones, with each zone requiring a specific coupon, is impractical. Further, there is no incentive to minimize the duration a vehicle occupies the parking location, that is, no "real time parking" capability.

Applicant, in U.S. Patent No. 4,717,815, has described a time metering device that is useful as a prepaid parking card. The device is a unitary electronic card purchased in advance by the user to provide a pre-purchased time period that may be used as and when desired by the user for parking his vehicle. The card has buttons to select the type of parking zone required, a timer clock showing the amount of purchased time remaining on the card, and switches to start and stop the timer clock. Thus, the user pays for only the actual time that a vehicle occupies a parking space. The card device is displayed within the vehicle during the time the vehicle occupies the parking location. Various other features of the parking card are also disclosed. However, it is desirable to provide a parking monitoring and fee assessment system that requires no special devices by the user. To this end, applicant has devised a unique method of monitoring and assessing a fee for parking a vehicle in a toll parking location. The method further provides means for detecting that a parked vehicle is in violation of the requirements for the toll parking location.

#### SUMMARY OF THE INVENTION

The invention is a method of monitoring and assessing a fee for parking a vehicle in a toll parking location. The invention includes providing indica for a toll parking location and unique indica for a vehicle to be positioned in that parking location. The user notifies a central control unit the location indica, the vehicle unique indica, and the start time of parking the vehicle in the location. Later, the user notifies a central control unit the vehicle unique indica, and the finish time of parking the

vehicle in the location. The central control unit then assesses a fee to the user for the duration of time the vehicle occupied the parking location.

To monitor the vehicles occupying a toll parking location, a controller individual images the unique indica of a vehicle parked in the toll parking location with a digital camera device having optical character recognition capability. The digital camera device transmits to the central control unit the digital data for the unique indica of the vehicle parked in the toll parking location. The digital camera device receives from the central control unit confirmatory data on the vehicle parked in the toll parking location. For those vehicles illegally parked, the digital camera device produces a pictorial record of the vehicle in violation of the toll parking location requirements. The digital camera device then prints a ticket document assessing a fine on the vehicle in violation of the toll parking location requirements.

The invention also includes the imaging device for imaging a vehicle with unique indica located in a toll parking location. The device has a means for imaging a vehicle unique indica, and optical character recognition means for digitizing the unique indica image. A storage means for retaining the digitized image of the vehicle unique indica is contained in the device. A transmitting means for communicating the digitized image of the vehicle unique indica to a central control unit, and a receiving means for obtaining data from the central control unit, is also contained in the device. Also present in the device is a means for producing a visual image of a vehicle unique indica, and means for printing a ticket document used for levying a fine for toll parking violation.

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#### DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is a method of implementing the "real time parking" concept, where the user pays only for the time the vehicle occupies a parking location. The novel method eliminates the need

for any hardware inside the vehicle and makes use of standard communication technology systems to improve and simplify user parking along city streets.

The toll parking locations are provided with various designations or indica, to identify them as a specific zone. Each vehicle to be parked in the toll parking locations is provided with a unique indica, such as a registration number or license plate number. The user parks his vehicle in one of the toll parking locations. The user then uses a telephone or modem to contact a central control unit notifying the unit of the parking zone occupied (location indica), the vehicle license number (vehicle unique indica), and the starting time of parking. The zone identification and telephone number of the central control unit are posted at or near each parking location. The user may call by telephone, e-mail, or otherwise contact the central control unit. Upon return to the parked vehicle, the user again employs a telephone, or similar communication means, to contact the central control unit notifying the unit of the vehicle license number (vehicle unique indica), and the finishing time of parking. The vehicle location need not be repeated since the central control unit already has it. The user is not compelled to notify the central control unit when he removes his vehicle from the parking zone. In this situation, the user is charged the full amount of time allowed for the parking zone ordered. For situations where the user must notify the central control unit of the start or finish of parking from a location distant from the vehicle, a grace period for enforcement, discussed later, is allowed. For users with cellular telephones, the notification of the central control unit is as simple as entering a series of numbers in the cellular telephone memory for transfer to the central unit. The central control unit then assesses the user a fee for the duration of time the vehicle occupied the parking location. The central control unit is preferably a computer system operated by the municipality, or an operator on behalf of the municipality, or even a private parking authority. The parking fee may be collected in various manners. At the discretion of

the vehicle usher, the fee may be added to a utility or telephone bill, paid by credit card over the telephone, or paid from a personal banking, parking credit system at the central control unit.

For parking locations that are in high demand, additional requirements are imposed on users that occupy these high demand parking locations. When parking in the high demand locations, the user is required to notify the central control unit when the user vacates the location. If the user does not notify on vacating the location, not only is he charged for the full time period ordered, but also an additional fee is added to the toll parking charge. The purpose of mandatory vacate notification is to allow the central control unit to monitor the number and location of the high demand toll parking locations. Further, users can access the availability of the high demand parking locations through the central control unit, thereby providing easier access by users to available toll parking locations.

The central control unit is continuously gathering extensive data on parked vehicles and the influx and departure of vehicles from the controlled parking areas. The data can be used for informing drivers of parking location availability as described above, as well as statistics of parking location use to improve city parking zone configurations.

Monitoring of vehicles parked in toll parking locations is achieved by parking officers using special automated cameras to verify the authenticity of the parked vehicles. A digital camera device, with optical character recognition (OCR) capability, is employed to scan the license plate (unique indica) of a vehicle parked in the toll parking location. The digital camera device then transmits the digital data of the vehicle license plate to the central control unit to verify the user has notified the unit that the vehicle is occupying the parking location. The data transmittal and reception by the digital camera device is by cellular or otherwise wireless communication. The digital camera device then receives confirmatory data from the central control unit on that particular vehicle.

If the vehicle user has notified the central control unit to initiate his parking time, the digital camera device will receive a confirmation signal, and the parking officer takes no further action. If that particular vehicle is illegally parked, the digital camera device receives a different confirmation signal and the parking officer issues a parking ticket using the digital camera device to print the ticket. Alternatively, the ticket printing may be achieved with a small auxiliary printer device connected to the digital camera device. Additionally, the parking officer uses the digital camera device to record and print a pictorial record of the illegally parked vehicle for use in court proceedings, if needed. It may be necessary to download "pictures" to the central control unit such that the digital camera device is not overloaded during a particular working shift for the parking officer.

As mentioned above, a grace period for enforcement of regulations is provided for the user who must notify the central control unit from a location some distance from the parked vehicle. For instance, a user parks his vehicle and continues on to his destination from where he notifies the central control unit of the details of the parked vehicle. The grace period to notify the central control unit is uniform within the city, and set by the particular municipality or the central control unit, e.g. 10 minutes. Since the officer and the central control unit are not aware when the vehicle started parking, the officer images the vehicle and leaves a pending ticket. If the user notifies the central control unit within the grace period, proper confirmation is obtained the next time the controller turns on the digital camera. This confirmation automatically cancels the pending ticket and erases the stored picture of the vehicle in the digital camera. Should the officer return to a vehicle already having a pending ticket, and the grace period has elapsed, a full ticket is issued. If the user does not notify the central control unit, or notifies after the grace period, the officer issues a ticket for the violating vehicle. Likewise, if the vehicle continues to occupy the parking location after the maximum time limit, the officer issues a

ticket. Preferably, the central control unit generates all parking tickets and mails the ticket to the home of the vehicle user. The central control unit is linked to motor vehicle ownership and registration to determine where to send the ticket. The ticket is sent to the vehicle user by registered mail to prevent the user from claiming that there was no sign of a ticket on the vehicle that was parked in the toll  
5 parking location.

Although the imaging device of the present invention is described as a digital camera device, other imaging devices are contemplated. The devices include video type cameras, and other "still" type imaging devices. The digital camera device of the present invention can be used as a stand-alone system that can be used to produce parking tickets supported by hard imaging evidence of the illegally parked vehicle. The stand-alone system can be employed with other widely used parking fee collection methods, such as metered parking locations, purchased parking permits for specific locations, or even limited duration "free parking".

The invention concept is based upon existing communication networks, with three categories of communication utilized. The users communicate with the central control unit through cellular telephone, "wired" telephone, or by using the Internet. The parking officer uses wireless communication for on-line data transmission and retrieval needs. Data is transferred through computer links on the Internet, such as Websites, servers or special "portals", or other network systems.

The central control unit is the heart of the system. All potential parked cars are registered at the central unit upon the user's request. All billing is handled through the central unit. All parking tickets are processed, and the central unit performs notification to users, with follow-ups performed.  
20 Court evidence is generated for use in cases where the user disputes the parking ticket.

The attached Tables 1, 2 and 3 list the various features that make the Parkulator Photo Parking

system unique.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

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## Parkulator Photo Parking System

<b>PARKULATOR INTERNET and TELEPHONE PARKING SYSTEM</b>		<b>PARKULATOR</b>	<b>Photo Parking</b>	<b>PARKULATOR</b>	<b>Parking Center</b>	<b>PARKULATOR</b>	<b>OFFICER</b>
USER							
Vehicle	Parking						
Registration							
Location- Zone							
Time							
Telephone or Internet							
Cell phone							
Conventional Phone							
Call within "grace"	-						
Call "too late"							
Send E Mail after car parking							
"Call" E Mail after car parking							
Call E Mail is a new method							
People can call by phone, leave verbal message that will automatically be converted to a "voicemail" e mail							

45 01 44 55 14 44 55 14 44 55 14 44 55

PARKULATOR PHOTO PARKING

અને એવી વિધાની પ્રયત્ની કરી બનાવી રહી હોય કે

## PARKULATOR PHOTO PARKING

		Option 3 Using Internet	
		1 Park Your Car	Right down "sign" for Zone Location to call later
		2 Leave Vehicle and go on your business	
		3 Call Parking center at:	parkulator@cityzoneregistration
1-800-ZONE - Registration		3 E Mail Parking Center	
4 Leave Vehicle and go on your business		3.10 Call an e mail message	
		TO END PARKING	
		1 Return To car	1-800-Leave - Registration
		2 Call Parking center at:	1-800-Leave - Registration
		e mail or call from standard telephone prior to departure or call from cell phone from vehicle	
		3 Drive Away	
		1-800-ZONE - Registration - TIME	
		3 Call Parking center at:	
		Call as soon as arrival to closest telephone	

I claim:

1. A method of monitoring and assessing a fee for parking a vehicle in a toll parking location comprising the steps;
  - 5 (a) providing indica for a toll parking location and unique indica for a vehicle to be positioned in that parking location;
  - (b) notifying a central control unit by the user, the location indica, the vehicle unique indica, and the start time of parking the vehicle in the location;
  - (c) notifying a central control unit by the user, the vehicle unique indica, and the finish time of parking the vehicle in the location;
  - (d) assessing, by the central control unit, a fee to the user for the duration of time the vehicle occupied the parking location;
  - (e) assessing, by the central control unit, an additional fee to the user for failing to notify the central control unit the finish time parking the vehicle in the parking location;
  - (f) imaging the unique indica of the vehicle parked in the toll parking location with a digital camera device having optical character recognition capabilities;
  - (g) transmitting to the central control unit, by the digital imaging device, the digital data for the unique indica of the vehicle parked in the toll parking location;
  - (h) receiving from the central control unit by the digital imaging device, confirmatory data on the vehicle parked in the toll parking location;
  - 20 (i) producing a pictorial record of the vehicle in violation of the toll parking location

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requirements; and

- (j) printing a ticket document assessing a fine on the vehicle in violation of the toll parking location requirements.

5 2. A device for imaging a vehicle with unique indicia located in a toll parking location comprising:

- (a) means for imaging a vehicle unique indicia;
- (b) optical character recognition means for digitizing the unique indicia image;
- (c) storage means for retaining the digitized image of the vehicle unique indicia;
- (d) transmitting means for communicating the digitized image of the vehicle unique indicia to a central control unit;
- (e) receiving means for obtaining data from the central control unit;
- (f) means for producing a visual image of a vehicle unique indicia; and
- (g) means for printing a ticket document used for levying a fine for toll parking violation.

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## **ABSTRACT**

The invention is a method of monitoring and assessing a fee for parking a vehicle in a toll parking location. The invention includes providing indica for a toll parking location and unique indica for a vehicle to be positioned in that parking location. The user notifies a central control unit the location indica, the vehicle unique indica, and the start time of parking the vehicle in the location. Later, the user notifies a central control unit of the vehicle unique indica, and the finish time of parking the vehicle in the location. The central control unit then assesses a fee to the user for the duration of time the vehicle occupied the parking location.

A method of monitoring parked vehicles to assure compliance with toll parking regulations is also disclosed. A digital camera device having optical character recognition capabilities photographs vehicle indica, plus transmits data to and receives data from the central control unit to ensure vehicle compliance with regulations. A ticket is issued to those vehicles violating the parking regulations. The digital camera device also makes a pictorial record of the violation.